Predicting the number of COVID-19 cases by ZIP Code
(Technical Report)

Controlling the Coronavirus: The German Case
(STS Research Paper)

An Undergraduate Thesis Portfolio
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by

Larry Cai

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Preface

How can coronavirus be contained? As of November 1, 2020, there are 46,386,903 COVID-19 cases globally and 1,199,500 COVID-19 related deaths. By studying preventative measures and applying the lessons, public health experts, epidemiologists, policymakers, advocacies, and conscientious citizens can contain COVID-19.

How can AI effectively predict coronavirus hotspots? In March, Guayaquil had a serious coronavirus outbreak. 778 people died on April 4, and corpses lay on the street[1]. Hector Hugo found COVID-19 hotspots by mapping 911 calls to locations. Guayaquil mayor, Cynthia Viteri, dispatched medical officials to treat patients at these locations. New York University Langone Health's City Dashboard displays neighborhood coronavirus risk in cities but does not have data on many cities such as Fairfax, Virginia. I predict the location of coronavirus hotspots by neighborhoods in Fairfax using reinforcement learning; we can send health officials to hotspots and email warnings to residents about local outbreaks.

How did health authorities in Germany achieve relative success in controlling the 2020 pandemic? Important participants include the Robert Koch Institute, Chancellor Merkel's administration, and German healthcare workers. Germany performed well by European standards. By studying preventative measures and applying the lessons, public health experts, epidemiologists, policymakers, advocacies, and conscientious citizens can contain COVID-19. Germany was able to control COVID-19 due to early testing, contact tracing, a developed health infrastructure, trust in the government, fast and consistent communication, and time to prepare for the virus. Some of these measures can be implemented in other countries such as developing the healthcare system.

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[1] Dube, R., & Córdoba, J. (2020, June 30). *Ecuador City Beat One of World's Worst Outbreaks of Covid-19*. WSJ. https://www.wsj.com/articles/ecuador-city-beat-one-of-worlds-worst- outbreaks-of-covid-19-11593532974

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